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NOTICE

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TALC

The annual production of talc and soapstone in California has increased from a few tens of tons in the early 1900's to 118,288 tons in 1954 to place the state second to New York as a source of these commodities. An estimated total of 1,830,000 tons of talc has been produced in California through 1956. At least nine-tenths of this output has been obtained from deposits in a 200-mile belt, along the eastern margin of California, where large quantities of talc have formed as alterations of pre-Cambrian and Paleozoic strata. The remainder consists mostly of soapstone quarried along the western foothills of the Sierra Nevada and in Los Angeles County. The talc mined in California is of numerous varieties, and is employed in many ways, but its main uses are in the manufacture of ceramic bodies and paint. It is consumed mostly within the state, but large tonnages also are shipped to out-of-state markets. Talc of steatite grade, which is unusually pure, is shipped to the eastern United States and used in the manufacture of high-frequency electrical insulators.

Mineralogy and Terminology. To the mineralogist "talc" is a distinct mineral species with a composition of $\text{H}_2\text{Mg}_3(\text{SiO}_3)_4$, but in commercial usage the term also alludes to a mixture of minerals most of which are high-magnesium silicates. The mineral talc is ordinarily, but not necessarily, a prominent constituent of commercial talc. Other minerals common in such mixtures include tremolite ($\text{Ca}_2\text{Mg}_5\text{Si}_8\text{O}_{22}(\text{OH})_2$), serpentine (a hydrous magnesium silicate), chlorite (an aluminosilicate of iron and magnesium), anthophyllite ($(\text{Mg},\text{Fe})_7\text{Si}_8\text{O}_{22}(\text{OH})_2$), olivine ($(\text{Mg},\text{Fe})_2\text{SiO}_4$), carbonate minerals, and quartz.

The chemical compositions of many commercial talcs, therefore, differ markedly from the composition of the pure mineral. For many uses the other minerals are either beneficial or harmless, but for uses such as in the manufacture of pharmaceuticals, cosmetics, and electrical insulators, they constitute impurities.

The mineral talc ordinarily can be distinguished by an extreme softness, a soapy feel, a flaky habit and a marked inertness. Most aggregates of pure talc grains are friable, but some are blocky. The properties that most determine the usefulness of the mineral talc are whiteness when ground and fired, softness and smoothness, good lubricating power, chemical inertness, a high fusion point, low electrical conductivity, and high absorption of certain types of greases and oils.

In current industrial usage the term "steatite" ordinarily is applied to high purity talc whose maximum allowable proportions of CaO , Fe_2O_3 , and Al_2O_3 are 1.5 percent, 1.5 percent and 4.0 percent respectively, and which is suitable for use as an ingredient in the manufacture of high-frequency electrical insulators (Klinefelter, et al., 1945).

Talcose rock from which bodies can be machined is known by the general terms "block talc," or "lava." "Block steatite talc" is block talc that meets steatite specifications. A small tonnage of massive chlorite, which resembles blocky talc in its physical appearance, is mined in California under the general designation of talc. The term "soapstone," as most commonly used, refers to a blocky material rich in the mineral talc, but containing impurities that prevent its use as a high-grade commercial talc.